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AUTHOR Parke, Ross D.

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ABSTRACT

This paper presents two studies which explored the manner in which the father interacts with his newborn infant and compared paternal and maternal interaction patterns. In contrast to earlier studies, a direct observational approach was employed that permitted a detailed specification of father behaviors in the presence of the newborn. In the first study, a time sampling observational procedure was used with 19 Caucasian, middle-class couples 6-48 hours after delivery. Two sets of observations were made: (1) mother-father-infant, and (2) mother-infant alone. Data revealed that the father was just as likely to interact with the baby as the mother. The second study consisted of a sample of 51 white and 31 black, lower-class couples from a large metropolitan general hospital. This time, observations were made on father-infant interaction, as well as mother-infant interaction, and mother-father-infant interaction. Results indicate that parents tend to react similarly to their infant when alone. Both studies indicate that the sex and ordinal position of the infant are important modifying variables in early parent-infant interaction. Implications of both studies suggest that the father plays a more active role in early social interaction than previous research indicated. (CS)

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Author: Ross D. Parke
Fels Research Institute and
The Fels Division of Pediatric Research
University of Cincinnati
College of Medicine

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Mother-newborn interaction has received increased attention in recent years (Thoman, Turner, Leiderman & Barnett, 1970; Richards & Bernel, 1971); research on the father's role in the newborn period, however, remains relatively unexplored. Although the father is often recognized in theoretical discussions (Nash, 1965), little empirical data is available concerning the father's behavior toward his infant in the early days of life. In part, this is due to the unavailability of fathers for study, but the paucity of information on father-infant relationships is also due to the secondary position assigned fathers by both the culture and psychological theorists (Bowlby, 1951). Research that has been executed has either been based on maternal reports (Pedersen & Robson, 1969) or on very limited samples of behaviors such as Rebelsky & Hanks (1970) who tracked only paternal verbalizations. While both studies suggest that father plays a qualitatively and quantitatively different role in early infancy, the exact nature of the interaction remains to be detailed. Moreover, no comparative data exists concerning maternal and paternal behavior toward their newborn infant.

To explore the manner in which the father interacts with his newborn infant and to compare paternal and maternal interaction patterns are the principal aims of the present investigations. In contrast to earlier studies, a direct observational approach was employed that permitted a detailed specification of father behaviors in the presence of the newborn. Three sets of observations were made.

Since the nuclear family setting is often the context of early infant-father encounters, both mother and father were present during one observation session; this triadic arrangement permitted a comparison of the manner in which the two parents differ in their interactions when they are together with their newborn child. Second, observations of mother-alone with the newborn infant were secured in the first study. A third set of observations of father-alone with his infant was included in the second investigation in this series. This set of three types of observations permitted an examination of "second-order effects", which Bronfenbrenner (1973) has defined as the impact of the presence of a third party on the pattern of interaction between two individuals. Specifically, we examined the modifying impact of the father's presence on mother-infant interaction by comparing the behavior of the mother alone with her infant and her pattern of interaction in the presence of father. Conversely, by comparing the interaction of the father's behavior when he was alone and in the presence of the mother, the modifying impact of the mother on paternal interaction patterns could be investigated.

A second aim is to explore the modifying impact or two factors on parent-infant interaction--sex and ordinal position of the infant.

First, what are the effects of the sex of the newborn infant on mother and father interaction patterns. While girls tend to

smile more in the newborn period (Freedman, 1971) and 3-month-old boys tend to cry more and be more irritable (Moss, 1967), there is a paucity of information concerning the impact of these behavioral differences on early parent-infant interaction. Thoman, Leiderman & Olson (1972) recently reported that primiparous mothers talk and smile more at female than male infants. Similarly, Rebelsky & Hanks (1971) report that fathers of female infants verbalized more than did fathers of male infants at 2 and 4 weeks of age. Moss (1967), on the other hand, found that mothers of three-week-old male infants vocalized more than mothers of female infants. Research involving direct comparisons of maternal and paternal behaviors with male and female newborn infants is clearly necessary to determine the nature of parental responsiveness to babies of different sexes. The present study will examine this issue.

The final issue concerned the effects of ordinal position of the infant on parent-newborn interaction patterns. Recent research (Thoman, Barnett & Leiderman, 1971; Thoman, Leiderman & Olson, 1972) has demonstrated that primiparous mothers stimulate, smile, and talk to their infants more than multiparous mothers. An aim of the present study was to examine the impact of infant ordinal position on both maternal and paternal behaviors.

Study I

The first investigation was conducted at University Hospital, Madison, Wisconsin; the sample was middle class and well educated. Nineteen Caucasian couples and their first-born infants served as subjects. Mothers ranged in age from 19 to 30 years, while fathers ranged between 20 and 38 years of age. With one exception, the fathers were present during both labor and delivery; half of the couples had attended Lamaze childbirth classes. The infant sample consisted of 19 full-term single-birth infants--9 males and 10 females. All of the infants were judged by the attending physician to be normal newborns without complications. With the exception of one Caesarian section, all births were spontaneous delivery or by use of low forcepts, vertex presentation. Thirteen infants were breast-fed and seven were bottle fed.

Procedure

Two sets of observations were made: (1) mother-father-infant and (2) mother-infant alone. The purpose of the study was introduced as "how babies develop social behavior--how they act with their mothers and father". The reason for presenting the infant as the main target of observation was to reduce parental anxiety concerning the observations. All observations took place in the mother's hospital room between 6 and 48 hours after delivery. For the mother-only sessions, the infant was placed in the mother's arms prior to the commencement of the observations. In the case

of the mother-father-infant sessions, the investigator was brought to the mother's room, and the observer asked, "Whom shall I give the baby to". The infant was then handed to the parent who indicated a preference to hold the child.

A time sampling observational procedure was used. A ten-minute observation period was divided into 40, 15-second intervals, and for each 15-second interval the observer recorded the occurrence of a parental or infant behavior. The following infant behaviors were recorded: cry, vocalize, move, mouth movements with or without object, look at mother, look at father, and look around. For both mother and father, the following behaviors were recorded: looks, smiles, vocalize, holds, kisses, touch, imitate, explores, feeds, and hands over to the other parent.

Each family was observed on a number of occasions across the two post-partum days. The number of observations varied slightly across family, with the average number of mother-infant observations being three; there were an average of two mother-father-infant observations. Inspection revealed that there were no day effects and, consequently, the mean of all sessions were combined for mother-infant and mother-father-infant observations. Thie yielded two scores for each family.

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Observer Training and Reliability Assessment

The main observer was a 30-year old female nurse; for reliability estimates a male of the same age was present. For purposes of

training the observers, 8 mm. films of mother-father- infant interaction were made in the same hospital room setting that was used for the regular observations. Prior to field observations, the two observers achieved a percentage agreement between 88 and 100% on all categories of infant, maternal, and paternal behaviors. In the hospital room the two observers watched mother-father-infant groups until a level of reliability comparable to the level achieved in the film training period was reached. Both observers were present for six observations sessions of mother-father-infant interaction and for eight mother-infant sessions. Inter-rater reliability was assessed by calculating the percentage of occasions across the 40-15 second time intervals that the observers agreed with each other. The mean percentage reliabilities for the mother-infant and mother-father-infant sessions ranged between 86 and 100% agreement between the two observers.

Results

In Table 1, the mean frequency of maternal and paternal behaviors directed toward the infant are presented. Of interest is the fact that the father is a very active participant in the family triad. Subsequent analyses of variance indicated only one significant effect: mothers smile more than fathers ($F=5.14$; $df=1, 18$; $p<.05$). Two other effects were of borderline significance. Fathers tended to hold the infant more than mothers ($F=3.27$; $p<.09$) and rock the

baby in arms more than his spouse ($F=3.18$; $p<.09$). On all other measures, father was just as likely to interact with the baby as the mother.

Since observations were made on both the mother alone and in the presence of the father, the effects of father presence on maternal-infant interaction was evaluated. The means for mother's behavior alone and in the father presence are presented in Table 1. The presence of the father reduced the amount of interaction between mother and baby. Mother was less likely to hold ($F=22.22$; $df=1,17$; $p<.001$), change position ($F=18.33$; $p<.001$), rock ($F=14.21$; $p<.001$), touch ($F=49.36$; $p<.001$) or vocalize ($F=32.12$; $p<.001$) when father was present.

Analysis of variance was used to assess the effects of sex of infant on parental interaction. Only one sex difference was present: both mothers and fathers touched male babies significantly more than female infants ($F=8.24$; $df=1/17$, $p<.01$). However, this sex difference was not present during the sessions when mother and baby were alone.

Study II

A more recent and extensive investigation of these issues extends the previous study in a variety of ways. First, observations of father-infant interaction, as well as mother-infant and mother-father-infant were included in this second study.

This permitted a comparison of father's interaction pattern with his infant under two conditions: alone with the infant and in the presence of the mother. Possibly, the high degree of paternal-infant interaction observed in the initial study was due to the supporting presence of the mother.

Moreover, the sample of fathers in the original study were unique in other ways that may have contributed to their high degree of interaction with their infant. Over half of the fathers had attended Lamaze childbirth classes and with one exception, all fathers were present during the delivery of the child. Both of these factors are likely to have increased the fathers' later involvement with their infants.

Finally, these fathers were well educated and middle class, and their high degree of involvement may be unique to middle-class groups; parental involvement may be less in lower-class samples due to a more rigid definition of parental roles among lower-class parents. To overcome the sample limitations of the original study, a group of lower-class fathers who neither participated in childbirth classes nor were present during delivery were observed. This study permitted a much more stringent test of father-infant involvement and permitted wider generalization of the previous findings. A final purpose was to examine parental interaction patterns with first and later-born infants of both sexes. If fathers and mothers do, in fact, differ in their interactions with their newborn, it is

likely that these parental differences will be marked with the first-born child.

Subjects

The sample was drawn from a large metropolitan general hospital in Cincinnati, Ohio. To date fifty-one white and thirty-one black families of lower socioeconomic status have participated. The age range for mother was 15 to 43 years ($\bar{X}$ 20.7), while fathers ranged in age from 17 to 47 years ($\bar{X}$ 23.6). The infant sample consisted of 48 girls and 34 boys; 17 boys and 17 girls were first born, while the remaining boys and girls were later born. Apgar scores for all infants were 8 or above at one minute; all infants were bottle fed. No fathers were present during delivery; fathers are routinely not permitted to handle their infants during the post-partum period. Special exemption from these restrictions made possible the father-infant observations.

Procedure

All contacts were made in the hospital, within the first 48 hours, and the study was introduced as "how babies develop social behavior--that is how they act with their mothers and fathers". Three types of observations were made: (1) mother-infant, (2) mother-father infant, and (3) father-infant. The observations involving mother (mother-infant and mother-father-infant) took place in the mother's hospital room. The father-infant observations were

made in a room near the newborn nursery, which was furnished with a comfortable chair. To increase the range of parental behaviors, the parents were informed that they could either pick up the baby or leave him in the crib. (In the earlier study, the baby was handed to the mother or whichever parent requested the baby in the case of the mother-father observations). A total of 82 families participated in the mother-father-infant session, while approximately half of these fathers and half of the mothers in each family were seen on a second occasion alone with their babies. In the case of repeat observations, an attempt was made to counter-balance order; inspection of the data revealed no order effects. All observations were 10 minutes; this period was divided into 40, 15-second intervals. The same infant and parental behaviors were observed as in the first study. Inter-observer reliability was established prior to the commencement of the study and ranged between 85% and 99% for infant and parent behaviors. Reliability was assessed by a second observer on 12 occasions for the mother-infant sessions, on 8 occasions for the father-infant sessions and on 14 occasions for the mother-father-infant sessions, during the progress of the study and prior reliability levels were maintained.

Results

First, the frequency of maternal and paternal behaviors directed toward the infant when they are together with the infant are depicted in Table 2. As in the earlier study, the father is a very active participant; analyses of variance revealed that father is significantly more likely than mother to hold and visually attend to the infant and to provide physical and auditory stimulation. Only in smiling does the mother outdistance the father. However, is the father's active involvement limited to the situation in which the mother is also present? To answer the question, we compared the father alone with the infant and the father in the presence of the mother. As Table 3 indicates, the mother's presence was clearly an unnecessary support for the father's active involvement. In fact, he was significantly more likely to touch and rock his infant when alone than with the mother. In general, he was an equally active participant in both settings. The presence of the mother had one positive effect: the father smiled more in her presence than alone. To examine how mother's behavior shifted across social contexts, we next examined her behavior alone and in the presence of the father. As Table 4 indicates, mother-infant interaction is much higher when the father is <u>not</u> present. Analyses of variance indicated that mother was significantly less likely to hold, touch, rock, vocalize to, imitate, and feed their offspring when father was present. However, mother was more likely to explore the infant

and smile at baby when the father was present than when she was alone with her newborn.

Perhaps the most important comparison involves mother and father alone with their infant. As Table 5 clearly indicates, when they are alone, fathers and mothers differed only slightly in their patterns of interaction; mothers fed the baby more frequently than father.

However, there were some sex and ordinal position differences that merit consideration. When mother and father are together, parents tend to hold first-born infants in their arms ($F = 2.80$; $df = 1,78$; $p<.10$) first born $\bar{X} = 16.06$ vs. later born $\bar{X} = 13.67$), while they hold later borns on their laps ( $F = 4.41$; $p<.01$; first born $\bar{X} = 2.04$ vs. later born $\bar{X} = 4.31$). Parents are more likely to walk with the first born ($\bar{X} = .43$) than a later born ($\bar{X} = .20$) infant ($F = 7.93$), particularly a first born boy ($\bar{X} = .50$ vs. 106 for first and later born boys respectively). Parents walked girls equally, regardless of ordinal position ($\bar{X} = .35$ and .27 for first and later born females). Finally, fathers touched first borns ($\bar{X} = 14.06$) more than later borns, ($\bar{X} = 10.98$) while mothers tended to touch later born infants ($\bar{X} = 9.92$) slightly more than first-born infants ($\bar{X} = 8.15$) ($F = 5.19$; $p<.05$)

The analysis involving mother alone and in the presence of the father indicated that mothers rocked first-born babies ($\bar{X} = 4.85$) more than later born ($\bar{X} = 3.46$) infants ($F = 4.14$; $df = 1,47$, $p<.05$) and boys ($\bar{X} = 5.05$) more than girls ($\bar{X} = 3.24$; $F = 4.45$; $p<.05$). However,

these ordinal position differences in maternal behavior varied with the presence or absence of the father. When the father was present the mother rocked first born ($\bar{X}$ = 1.40) and later born ($\bar{X}$ = 1.17) infants equally. ($F = 8.35$; $p<.01$).

The father analysis (father alone vs. in the presence of mother) revealed sex x ordinal position interactions for touching ($F = 4.42$; $p<.05$) and vocalizing ($F = 4.60$; $p<.05$). Father, regardless of alone or with mother, touched first-born boys ($\bar{X}$ = 19.87) more than either later born boys ($\bar{X}$ = 12.38) or girls of either ordinal position ($\bar{X}$ = 15.63 and 16.00 for first and later-born girls). Fathers vocalized more to first-born boys ($\bar{X}$ = 16.56) than to first-born girls ($\bar{X}$ = 8.94); while he vocalized equally to later born infants irrespective of sex ($\bar{X}$ = 13.27 and $\bar{X}$ = 13.33 for boys and girls respectively).

In summary, both sex and ordinal position are important modifying variables in early parent-infant interaction[2].

Implications

First, the father plays a more active role in early social interaction than previous research suggests (Rebelsky & Hanks, 1971; Pederson & Robson, 1969). Moreover, this high degree of involvement on the part of fathers is not restricted to middle-class highly educated groups, nor is the presence of the mother a necessary setting condition. However, there are other contextual factors that must be taken into account. Most importantly, the restraints imposed by the hospital setting probably affected the amount of father

interaction and may account, in part, for the level of father interaction. The home situation, on the other hand, offers more freedom concerning how and when a father will interact with his infant. Whether a high frequency of father-child interaction in the hospital setting is predictive of father-infant behavior in other contexts remains to be determined. Follow-up studies are currently being executed in order to determine whether or not the amount and/or the patterns of parental-infant interaction during the newborn period are of predictive value for later behavior.

Another related issue merits consideration. At present, there is considerable controversy concerning the importance of the opportunity for early contact between parents and infants for later parent-child relationships; this controversy, of course, has important implications for hospital caretaking arrangements and visiting schedules. Recent research (Klaus, Jerauld, Kreger, McAlpine, Steffa, & Kennell, 1972) has indicated that mothers who were given extended contact with their infants over the first three post-delivery days engaged in more soothing, eye-to-eye contact and fondling at one month than mothers who were given only feeding contact with their infants during this period. Whether or not a similar "early exposure" effect occurs for fathers as well merits examination. Specific attention should be paid to the effects of father-infant contact in the presence of the mother as well as father-infant contact alone. Possibly, the opportunity for early interaction as a triad is associated with increased sharing of responsibility for infant caretaking as well as increased father-infant attachment in the post-hospital period.

Both sex and ordinal position of the infant are important determinants of parent-infant interaction--even in the first days of life. These findings extend prior research (Thoman, et al. 1970, 1971) by indicating that fathers as well as mothers respond differentially to these infant characteristics. Infant changes induced by maternal medication and labor may also affect parent-infant interaction patterns (Parke, O'Leary & West, 1972). At birth, it is clear that an understanding of socialization requires a bi-directional model, which recognizes the infants' role in the mutual interaction sequence (Bell, 1968). Moreover, as Osofsky and Danzger (1973) have recently demonstrated, independent behavioral assessments of the infant outside the interaction context may be a particularly fruitful technique for determining the infant's contribution to early social interactions.

The similarity in behavior between mother and father is striking. Is father merely "a mother in a hospital gown"? Have we overestimated the uniqueness of the mother-child relationship? Shifting norms dictating greater mutual responsibility for caretaking and child rearing, are, of course, based on this assumption. However, before we conclude that mothering is not a unique set of activities, our observational methodologies need to be improved so that we can provide a richer picture of the reciprocal interaction patterns that are now obscured by our reliance on frequency counts. Possibly, it is not the amount of social input that is

unique, but the qualitative features of the social interaction. In other words, do fathers respond to the same kinds of infant social signals that mothers do? And, do they respond with similar kinds of input? It is in these complex matrices of reciprocal interaction that we are likely to define more adequately the subtle and unique differences associated with motherhood and fatherhood.

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## FOOTNOTES

[1] The first study was carried out in collaboration with Sandra E. O'Leary and Stephen West at the University of Wisconsin.

The second study was executed in Cincinnati, Ohio; thanks for assistance in various phases of the research to Elizabeth Bodde, Sue Dimiceli, Frances Hall, Keri Lord, Alice Rudolph, and Lynn Woodhouse.

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[2] Racial comparisons are beyond the scope of the present paper.

TABLE 1

Mother-Father Behaviors in the Presence of the Infant (Wisconsin Sample)

| | Father & Mother Present | | Mother Alone |
|---|---|---|---|
| | Father[1] $\bar{X}$ | Mother[1] $\bar{X}$ | Mother[1] $\bar{X}$ |
| Hold Arms | 23.1 | 12.7 | 31.4 |
| Hand Over | .28 | .42 | 0.0 |
| Change Position | 3.5 | 1.7 | 5.5 |
| Look | 38.7 | 37.0 | 37.7 |
| Vocalize | 5.2 | 3.7 | 12.0 |
| Smile | 8.6 | 14.3 | 11.3 |
| Rock | 3.1 | .63 | 4.6 |
| Touch | 13.7 | 12.3 | 26.9 |
| Explore | 1.0 | .68 | 1.2 |
| Kiss | .10 | 0.0 | .11 |
| Imitate | .68 | .31 | .39 |
| Feed | 2.1 | 7.1 | 12.7 |

[1] N = 19

TABLE 2

Mother-Father Behaviors Together With The Infant[1]
(Ohio Sample)

| | Mother & Father Present | | | |
|---|---|---|---|---|
| | Mother $\bar{X}$ | Father $\bar{X}$ | $F^2$ | P |
| Hold Arms | 7.73 | 21.59 | 34.79 | <.01 |
| Hold Lap | 2.66 | 4.09 | -- | -- |
| Hand Over | .68 | .71 | -- | -- |
| Change Position | 3.61 | 8.05 | 21.73 | <.01 |
| Look | 38.67 | 39.32 | 5.32 | <.05 |
| Vocalize | 4.02 | 11.90 | 40.54 | <.01 |
| Smile | 9.15 | 7.68 | 4.87 | <.01 |
| Rock | 1.55 | 5.55 | 11.99 | <.01 |
| Walk | .15 | .44 | 9.42 | <.01 |
| Touch | 9.18 | 12.26 | 8.64 | <.01 |
| Explore | 2.62 | 3.26 | 15.30 | <.01 |
| Kiss | .16 | .30 | -- | -- |
| Imitate | .01 | .20 | 12.40 | <.01 |
| Feed | 2.91 | 8.23 | 17.52 | <.01 |

[1] N = 82

[2] df = 1/78

TABLE 3

Father Behaviors Alone and in the Presence of the Mother (Ohio Sample)

| | Father Alone[1] | Mother Present[1] | | |
|---|---|---|---|---|
| | Father X | Father X | F[2] | P |
| Hold Arms | 26.41 | 21.77 | -- | -- |
| Hold Lap | 7.61 | 2.89 | -- | -- |
| Change Position | 11.18 | 8.84 | -- | -- |
| Look | 38.91 | 39.43 | -- | -- |
| Vocalize | 13.61 | 12.59 | -- | -- |
| Smile | 5.39 | 7.89 | 6.59 | <.05 |
| Walk | .93 | .45 | -- | -- |
| Rock | 13.61 | 3.02 | 31.11 | <.01 |
| Touch | 18.36 | 12.77 | 12.44 | <.01 |
| Explore | 2.07 | 3.43 | -- | -- |
| Kiss | .20 | .18 | -- | -- |
| Imitate | .98 | .25 | -- | -- |
| Feed | 10.23 | 10.02 | -- | -- |

[1] $N = 44$

[2] $df = 1/40$

TABLE 4

Mother Behaviors Alone and in the Presence of the Father[1] (Ohio Sample)

| | Mother Alone | Father Present | | |
|---|---|---|---|---|
| | Mother $\bar{X}$ | Mother $\bar{X}$ | $F^2$ | $P$ |
| Hold Arms | 24.87 | 7.58 | 65.56 | <.01 |
| Hold Lap | 6.60 | 1.53 | 20.19 | <.01 |
| Change Position | 13.67 | 3.45 | 80.05 | <.01 |
| Look | 38.62 | 38.73 | -- | -- |
| Vocalize | 9.73 | 4.85 | 9.95 | <.01 |
| Smile | 3.76 | 9.18 | 32.99 | <.01 |
| Walk | .24 | .22 | -- | -- |
| Rock | 6.67 | 1.25 | 16.60 | <.01 |
| Touch | 17.36 | 9.78 | 29.38 | <.01 |
| Explore | 1.16 | 3.09 | 10.03 | <.05 |
| Kiss | .45 | .24 | -- | -- |
| Imitate | .11 | .02 | -- | -- |
| Feed | 16.27 | 3.47 | 50.92 | <.01 |

[1] $N = 55$

[2] $df = 1,51$

TABLE 5

Mother Behaviors and Father Behaviors
Alone With the Infant
(Ohio Sample)

| | Mother Alone | Father Alone |
|---|---|---|
| | Mother[1] X | Father[2] X |
| Hold Arms | 26.59 | 26.74 |
| Hold Lap | 5.44 | 7.28 |
| Change Position | 13.33 | 11.49 |
| Look | 38.31 | 38.72 |
| Vocalize | 10.54 | 13.00 |
| Smile | 3.44 | 4.79 |
| Walk | .31 | 1.00 |
| Touch | 17.62 | 18.41 |
| Explore | .95 | 1.85 |
| Kiss | .31 | .23 |
| Imitate | .05 | 1.05 |
| Feed | 17.46 | 8.92[2] |

[1] $N = 39$

$F = 7.64$; $df = 1,35$; $p<.01$